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09/831,001	09/19/2001	Cindy Theresa Cornelia Cuypers	702-010717	8959

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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/831,001

Applicant(s)

CUYPERS ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-24 and 27-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-24 and 27-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claims 13-24 and 27-34 are pending in the application after the RCE.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 27-32 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 27 recites the limitation "rotating means" in indent 'c'. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 13-21 and 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/49477 in view of Hodgson (US 4,187,089).

Claim 13: WO 97/49477 discloses a device for treating a gas/liquid mixture comprising a tube (1 – fig 1) with inlet (A-fig1) and outlet (8-fig 1), rotating means (5-fig

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1), outlet openings down-stream of the rotating means for lateral flow of the liquid drops (9-fig 1), an axial return conduit centrally located through the rotating means (12-fig 1), and divergence element in the return conduit (7-fig 1). The flow path of the mixture comprises the flow path as outlined in claim 13 (see figure 1). Re the limitation of the flow to diverge "substantially" laterally: Word substantial means "considerable in quantity" (Webster's Collegiate Dictionary, 10th Ed.), and considerable quantity of flow could diverge from the axial direction from the nozzle 7 of WO'477. See page 4 lines 5-8, where it describes the secondary flow being drawn by the main flow due to the cyclonic action of the main flow, and the main flow is described as "... at least to a considerable extent radially ... together with ... 20% of the gas flow..." in page 3 lines 29-36.

WO'477 does not teach an axial obstruction in the return flow line. Hodgson teaches an axial flow obstruction (44) in a flow line that carries liquid drops in a gas stream – see the figures which would provide a substantially diverging flow from the divergence element. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Hodgson in the teaching of WO'477 to have the axial conical obstruction to have the gases impinge the obstruction so as to coalesce the liquid droplets in the gas stream, thereby effectively removing the final traces of liquid from the gas stream, as taught by Hodgson (see col 1 lines 45-50).

Claim 14: Divergence element comprises slots in the return conduit – see at 46 of the figures of Hodgson. Space between the baffles are open slots.

Claim 15: The divergence means is a "substantially" conical element extending into the return conduit (Figures of Hodgson).

Claim 16: The outlet openings are a number of longitudinal slots as in instant claim 16 (9-fig 1)

Claims 17 and 18: The rotating means is a swirl element with varying outflow angle (see figure 1).

Claim 19 adds further limitation of the size of the separated droplets, which WO 97/49477 in view of Hodgson does not teach. However, it would be obvious to one of ordinary skill in the art at the time of invention to realize that the separation apparatus having similar structure as in the present application would generate similar sized droplets in a gas-liquid separation.

Claims 20 and 21 add further limitations as follows: WO 97/49477 discloses an installation (page 2 line 17- page 3 line 2; fig 1) having a vessel with a supply connections stub (A-fig 1), one or more boxes in which one or more devices for treating gas/liquid mixture is arranged (page 2 line 34 – page 3 line 2) as in instant claims 20 and 21. WO 97/49477 does not describe a liquid drain conduit from the bottom of the vessel as in claim 20. Hodgson teaches a liquid drain from the bottom of the vessel (50,52-fig 1). It would be obvious to one of ordinary skill in the art at the time of invention to provide a drain for the liquid as taught by Hodgson in the teaching of WO'477 for disposing the collected liquid.

Claim 27: limitations in claim 27 are similar to that of claim 13 – see the rejection of claim 13.

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Re claims 28-32, the additional limitations are similar to that of claims 14-18, and are described in the rejections of claims 14-18 above.

Claims 33 and 34: conical element is disposed at the end of the conduit in Hodgson - see figures of Hodgson.

2. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/49477 in view of Hodgson (089) as in claim 13 above and further in view of WO 93/05339.

WO 97/49477 in view of Hodgson discloses a device according to claim 13 as described above, with inlet opening for the mixture (A-fig 1), and rotating means for setting the mixture to a rotating motion (5-fig 1) as in instant claim 22.

WO 97/49477 in view of Hodgson does not disclose a conical outlet with 1-30 deg cone angle as in instant claim 22 and 23 or an additional tube part as in instant claim 24. WO 93/05339 teaches such a conical outlet (3, fig 1) and an additional tube part (9-fig 1) in the outlet of a similar liquid-gas mixture separation device. It would be obvious to one of ordinary skill in the art at the time of invention to use the teachings of WO 93/05339 in the teachings of WO 97/49477 in view of Hodgson to make the outlet end conical with the additional tube part because it would decrease the carry over of the liquid droplets in the gas stream as taught by WO 93/05339 (lines 20-37, page 10)

Response to Arguments

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Applicant's arguments filed 5/17/04 have been fully considered but they are not persuasive.

In response to applicants' argument that the Hodgson teaches a horizontal vapor liquid separator, this argument is beyond the scope of the claims, and also would not be patentable even if claimed unless applicant can show with evidence that the vertical orientation of the applicants' apparatus provides unexpected/superior results.

In response to applicants' argument that the Hodgson teaches a conical baffle for the express purpose of reversing the flow and to coalesce the liquids, whereas the applicants' purpose is to diverge the flow substantially laterally: the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, the '477 reference has gas with liquid droplets, and Hodgson teaches removal of the last traces of liquid droplets from the gas stream at the conduit 38. One of ordinary skill in the art would use this teaching of Hodgson in the teaching of '477 to remove the liquid droplets from the return conduit.

Conclusion

This is a first action after an RCE, and is made non-final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon
Patent Examiner


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